Claims

What is claimed is:

1. A method for identifying a quadruplex interacting molecule which comprises

a) contacting

i) a test molecule with a first detectable nucleic acid comprising a G-quadruplex, and

ii) and a second nucleic acid; and

b) determining whether the second nucleic acid competes for the test molecule whereby the test molecule is identified as a candidate molecule where the second nucleic acid competes for the test molecule.

2. The method of claim 1, wherein step b) comprises detecting the amount of the first nucleic acid to form a quadruplex and the amount of the first nucleic acid not forming a quadruplex and determining the concentration of the second nucleic acid required to compete for about half of the test molecule.

3. The method of claim 2, wherein the concentration of the first nucleic acid forming the quadruplex and not forming the quadruplex is determined using a fluorescence assay, a gel mobility shift assay, a polymerase arrest assay, transcription reporter assay, DNA cleavage assay, protein binding assay, or a apoptosis assay.

4. The method of claim 2, wherein the concentration of the first nucleic acid forming the quadruplex and not forming the quadruplex is determined using capillary electrophoresis.

5. The method of claim 1, wherein the second nucleic acid is plasmid DNA, short duplex DNA, random single-stranded DNA that does not form a quadruplex structure, single-stranded DNA that forms the same or a similar quadruplex structure as the quadruplex structure in the first nucleic acid, or single-stranded DNA that forms a quadruplex structure different from the quadruplex structure in the first nucleic acid, a triplex sequence or a duplex sequence in the Z conformation.

6. The method of claim 2, wherein the concentration of the second nucleic acid required to compete for about half of the test molecule is determined by detection of a signal molecule.

7. The method of claim 6, wherein the signal molecule is a chromophore.

8. The method of claim 7, wherein the chromophore is a fluorophore.

9. The method of claim 8, wherein the fluorophore is N-methylmesoporphyrin.

10. The method of claim 6, wherein the signal that is detected is a fluorescent signal.

11. The method of claim 6, wherein the fluorescent signal generated by the sample is detected after the sample is contacted by the test molecule and the test molecule is identified as a candidate molecule that interacts with a nucleic acid when the fluorescent signal detected before the sample is contacted with the test molecule differs from the fluorescent signal detected after the sample is contacted with the test molecule.

12. The method of claim 1, wherein the test molecule is an organic molecule or inorganic molecule having a molecular weight of 10,000 grams per mole or less.

13. The method of claim 1, wherein the test molecule is a polypeptide.

14. The method of claim 1, wherein the test molecule is a polypeptide linked to a phage.

15. The method of claim 1, wherein the test molecule is a polypeptide expressed by a microorganism transfected with a nucleic acid from an expression library.

16. The method of claim 1, wherein the test molecule and the signal molecule are contacted with a quadruplex nucleic acid simultaneously.

17. The method of claim 1, wherein the quadruplex nucleic acid comprises a nucleotide sequence selected from the group consisting of the nucleotide sequences set forth in Table 1.

18. The method of claim 1, wherein the first nucleic acid is attached to a solid support.

19. The method of claim 1, wherein the second nucleic acid is attached to a solid support.

20. The method of claim 1, wherein the test molecule is attached to a solid support.

21. A method for ameliorating a cellular proliferative disorder comprising administering to a subject in need thereof an effective amount of a compound identified by the method of claim 1 or a pharmaceutical composition thereof, thereby ameliorating the cellular proliferative disorder.

22. The method of claim 21, wherein the cellular proliferative disorder is a cancer.

23. The method of claim 22, wherein the cellular proliferation is reduced or cell death is induced.

24. The method of claim 23, wherein the subject is a human or an animal.

25. A method for ameliorating a viral infection comprising administering to a subject in need thereof an effective amount of the compound identified by claim 1 or a pharmaceutical composition thereof, thereby ameliorating the viral infection.